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ASTRONOMERS PREPARING FOR A VOYAGE TO JAPAN.

NEW YORK, December 3.—Professor DAVID TODD, of Amherst College, was aboard ARTHUR JAMES' schooner-yacht *Coronet* to-day, attending to the stowing away of the astronomical apparatus which he and his associates will make use of in their observations of the total eclipse of the Sun, on August 9th, from Akeshi, on the Japanese island of Yezo. The greater part of the apparatus which the *Coronet* will carry around the Horn on her trip to San Francisco, where Mr. JAMES and Professor TODD and their friends and fellow-workers will board her, was put away in the hold, and the rest of it was placed in the cabin.

The schooner will sail Thursday, and when the dispatch comes from San Francisco that she has arrived there, the members of the expedition will leave the East by rail to start from the Golden Gate on their cruise of several thousand miles over the Pacific Ocean.—*S. F. Chronicle.*

A SECOND CHAPTER OF HELIUM.

Three months ago we recorded the exultation of astronomers over the identification of "Helium"—the "running to earth," as Lord Kelvin neatly expressed it, of the problematical element which makes itself so conspicuous in the spectrum of the solar prominences, and in many notable stars and nebulæ, while keeping most furtively concealed on our own planet. For a time some justifiable skepticism as to the validity of the identification remained, on the ground that a single line in the spectrum, even D_3 itself, could hardly give evidence sufficient to warrant a confident conclusion; but the lingering incredulity was soon dissipated when observers found in the spectrum of the new gas half a dozen other lines corresponding to certain lines in the prominence-spectrum which had remained hitherto unidentified, like D_3 itself, and had been supposed to have the same origin.

It was with something like consternation, therefore, that in June astronomers received the announcement from RUNGE, an eminent German spectroscopist, that, in the spectrum of the terrestrial gas, the line assumed to be identical with D_3 is *double*, and that unless D_3 itself is also double in the chromosphere spectrum the identification must be given up. Of course, the solar observers at once began to study the line most carefully,—at first without success; but before the month closed a brilliant

prominence made its appearance, and in its spectrum Professor HALE found the line double, just as it ought to be. The observation was difficult, but others—in fact, all who had spectroscopes of sufficient power—soon confirmed it; so that now there can remain no possible doubt on the question of identity.

Professor RAMSAY has detected small quantities of helium in several other minerals besides the uraninites, in which it was originally discovered. Its presence in meteoric iron is especially interesting, where it is found associated with the hydrogen and and the various carbon gases which have long been known to be “occluded” in these celestial visitors.

The new element turns out to be, next to hydrogen, the lightest of all known gases, its density being about one-seventh that of air, or two on the hydrogen scale. Like hydrogen, it is never found free in our atmosphere; but unlike hydrogen, which in its combinations with oxygen and carbon is most abundant upon the earth, helium is extremely rare, and seems, like its associate, argon, to be almost without chemical affinities. Certain apparent coincidences between lines in the spectrum of argon and of this terrestrial helium seem to Professor RAMSAY to indicate either some third still unknown gas associated with argon and helium in the minerals from which they are obtained, or else some close and unexplained physical relation between the two.—Professor C. A. YOUNG, in *The Cosmopolitan*, November, 1895.

VARIABLE STAR CLUSTERS.

Professor SOLON I. BAILEY, in charge of the station at Arequipa, maintained by this observatory, has discovered from an examination of the photographs obtained by him of certain globular clusters, that they contain an extraordinary number of variable stars. This is not a general condition of stellar clusters, however; for in others similarly examined by Professor BAILEY, no variable stars have been found. The photographs used in this discussion were taken at Arequipa with the BOYDEN thirteen-inch telescope. In the cluster in *Canes Venatici*, MESSIER 3 (N. G. C. 5272), no less than eighty-seven stars have been proved to be variable from an examination of fifteen photographic plates. The change in every case is certain, and has been confirmed independently by Mrs. FLEMING and the writer from an examination of six of these plates. Sometimes the variation